

Rationale Sheet
State of Tennessee
NPDES General Permit for
Discharges Associated with Ready Mix Concrete Plants
September, 2001

- I. Background
- II. Description of discharges
- III. Present Permit Conditions
- IV. Present condition methodology
 - A. Technology-based effluent limitations
 - B. Water quality-based limitations
- V. Proposed effluent limits and rationale
 - A. Pollutants to be limited and standard technology
 - B. Proposed limits for each parameter
 - C. Proposed monitoring and reporting requirements
 - D. Other conditions
- VI. Notification requirements and authorization to discharge
 - A. Permit coverage
 - B. Notice of Intent (NOI) requirements
 - C. Authorization to discharge
- VI. Permit issuance procedures

I. Background

Facilities considered in this rationale sheet are ready mix concrete plants located in the State of Tennessee which discharge either storm water runoff or process waste water, or both, to the waters of the State. These facilities mix concrete onsite from its constituents, also located on the facility site, for use at job sites located elsewhere. These constituents include cement, stone, various sands, and may include a variety of chemical additives which manipulate the physical properties of the concrete.

Vehicle cleaning and washing procedures result in the discharge of process waste water from the site to the waters of the State. Storm water runoff is also discharged from the ready mix concrete facility sites.

Water pollution control laws require that discharges of such water into the waters of the State of Tennessee or of the United States be permitted by the Department of Environment and Conservation and that the quality of the discharged water meet standards set by the Department.

Over the last five years in Tennessee, the Division has issued approximately 3 individual National Pollutant Discharge Elimination Systems (NPDES) permits and approximately 240 general NPDES permits for storm water runoff and/or process waste water discharges associated with operations of ready mix concrete facilities to the waters of the State.

Because permit requirements for all ready mix concrete facilities are similar, and because of the number of facilities in operation, it is the opinion of the Division of Water Pollution Control that this category of sources would be controlled more appropriately under an NPDES general permit than under individual permits.

This rationale sheet describes and gives the basis for permit conditions to be applied statewide to these discharges of storm water and process wastewater associated with the operation of ready mix concrete facilities.

II. Description of discharges

This permit will address sites which discharge treated process waste water and/or storm water runoff.

During the operations at these facilities, dust from cement and other concrete constituents cover the concrete mixer trucks. These vehicles are washed down to remove this dust prior to leaving the site. At the end of each day, or after changes in the concrete mixture, the waste concrete must be dumped and the mixing barrel

washed out to prevent the concrete from setting up inside the mixer. The number and size of trucks used at the facility, the amount of dust to be washed off the vehicles, the number of concrete or job changes requiring barrel washout, and the use, if any, of water recycling are variables which contribute to the quantity and quality of the process waste water at the sites.

Storm water will come into contact with stockpiles of raw material, process materials and equipment, and process waste waters prior to their discharge or runoff from facility sites. The quality and quantity of storm water runoff can be affected by topography and operational layout of the site, house keeping policies and the extent of storm events.

III. Present permit limits

The Division on November 25, 1996, issued General NPDES Permit for Discharges of Storm Water Runoff and Process Waste Water Associated with Ready Mix Concrete Facilities (TNG110000). This general permit expires November 24, 2001. The limits contained in this general permit are as follows:

Process waste water effluent limitations

<u>Parameter</u>	<u>Monthly Average Concentration mg/L</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Flow	-----	1/month	Totalized
Total Suspended Solids	50	1/month	Grab
pH	6.0 – 9.0 S.U.	1/month	Grab

Storm water effluent limitations

<u>Parameter</u>	<u>Monthly Average Concentration mg/L</u>	<u>Measurement Frequency</u>	<u>Sample Type</u>
Chemical Oxygen Demand	-----	1/year	Grab
Total Suspended Solids	-----	1/year	Grab
pH	-----	1/year	Grab

IV. Permit Condition Technology

A. Technology-based effluent limitations

Under state and federal law and regulations, a discharge permit must establish limitations equivalent to best available technology (BAT) for toxic pollutants and best conventional pollutant control technology (BCT) for conventional pollutants. For some industry categories, such limitations have already been established by the Environmental Protection Agency (EPA). This is not the case with ready mix concrete facilities discharges; thus the Division will propose best professional judgment (BPJ) limits equivalent to BAT and BCT.

B. Water quality-based limitations

Permits must also contain any requirements, in addition to or more stringent than technology-based limits, necessary to achieve water quality standards or to control all pollutants which may be discharged at a level which will cause, have the reasonable potential to cause or contribute to an excursion above any state water quality standard, including narrative criteria.

V. Proposed effluent limits and rationale

A. Pollutants to be limited and standard technology

Given the potential contaminants, it is the opinion of the Division that the minimum standard method for the treatment of the process waste water associated with the operation of ready mix concrete facilities is a filter or settling pond or basin, with additional natural or chemical treatment required to meet the effluent limitations set forth in this permit. The basin or pond acts as a collection point for process waste water (and potentially storm water runoff), and allows the waste water to be held for a sufficient period for the contaminants to be settled out, either naturally or artificially, as well as allowing any additionally required treatment to take place. The Division believes that this treatment method is equivalent to BCT.

Since the previous permit was issued in 1996, the Division has been reviewing water quality in surface streams in Tennessee. In 1998, and in subsequent years, the Division has identified waters that do not meet water quality criteria, the parameter for which the waters do not meet the standards, and the source of the parameter. The Division has identified

siltation as a parameter that causes impairment. The Division proposes to require recycle systems for process wastewater where discharges of process wastewater would enter impaired streams.

The Division has also identified waters that are of exceptional water quality. The Division proposes to require recycle systems for process wastewater where discharges of process wastewater would enter high quality waters to prevent degradation of the receiving waters.

The Division proposes limiting the following parameters for process waste water discharges: Total Suspended Solids (TSS) and pH. Suspended solids are of concern because concrete is a mixture of particles in water. Limitations for pH are needed since the components within cement mixtures are basic and will result in elevated pH of discharges.

The Division proposes monitoring the following parameters for discharges of storm water runoff: Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), and pH. These items represent the major concern parameters of EPA's multi-sector permit for storm water discharges for storm water discharges associated with industrial activity, with respect to the ready mix concrete industry. The pH and TSS are of concern in storm water runoff because a number of the raw materials at ready mix facilities are stored outside and are exposed to storm water. Chemical Oxygen Demand is proposed because this test readily indicates the presence of spilled oils and fuels, from vehicles and equipment, and also of organic matter which may be found in concrete admixtures.

B. Proposed limits for each parameter

Discussed below is the Division's rationale for limitations for each parameter. In determining the proposed limit or monitoring concentration for discharges, the Division first considers the BPJ-BAT or BPJ-BCT based treatment capability, then the water quality-based criteria. The chosen proposed limit is the most conservative limit required to protect receiving streams.

i. Proposed limits for process waste water discharges

Total Suspended Solids

Rule 1200-4-5-.03(2) provides a maximum effluent limitation for TSS of 40 mg/L. However the rule provides that where it can be demonstrated that treatment by practical conventional unit

treatment processes cannot provide compliance with the state maximum effluent limit, another reasonable effluent limitation may be established. The Division reviewed data during the last issuance of the general permit and made the determination that 50 mg/L daily maximum would be more appropriate. This limitation will be retained in the reissued general permit.

In addition, the following standard permit condition, which is based on Tennessee narrative water quality criteria, will apply, “there shall be no distinctly visible floating scum, oil or other matter contained on or in the waste water discharge.”

pH

The Division proposes a technology-based pH limit of 6.0 – 9.0 standard units. The basis is Department rule 1200-4-5-.03. The Division believes the proposed range of 6.0 – 9.0 standard units will provide protection of the state’s waters.

- ii. Proposed monitoring requirements for discharges of storm water

Chemical Oxygen Demand

The Division proposes a monitoring requirement of 100 mg/L. The basis for this concentration is the Nationwide Urban Runoff Program (NURP) data for residential and commercial areas. Additional information is available from the Tennessee Ready Mix Concrete Plant group application (1992).

Total Suspended Solids (TSS)

TSS are the solid materials which are suspended in the water. The Division proposes a monitoring concentration of 200 mg/L. The basis for this concentration is the Nationwide Urban Runoff Program (NURP) data for residential and commercial areas.

pH

The Division proposes a pH monitoring range of 4.0 – 9.0 standard units. The average pH of rainfall is approximately 4.5 standard units.

Floating Material, Color, Foam, Oil Sheen

In addition, the following standard permit conditions, which are based on Tennessee narrative water quality criteria, will apply, “there shall be no distinctly visible floating scum, oil or other matter contained on or in the waste water discharge.

C. Proposed monitoring and reporting requirements

Measurement frequency for all process waste water parameters will be once per month. The Division believes these frequencies are necessary and adequate to characterize discharges and to determine compliance with permit limits.

Reporting of results for process waste water will be required once per month.

The results will be submitted using the appropriate Discharge Monitoring Reports (DMR) form supplied by the Division of Water Pollution Control. The results will be submitted to the Division of Water Pollution Control.

Monitoring frequency for storm water runoff will be once per year.

Reporting of results for storm water runoff monitoring will be required at the end of each monitoring year. The permittee shall submit a summation of the monitoring results to the Division of Water Pollution Control.

D. Other conditions

Washout sites

Typically, concrete trucks must be washed out to keep the concrete from hardening in the mixing drum. Washout may occur at the job site, at the plant site, or at some other site. Such washout often has the potential of running into waters of the State and the Division has, over the years, seen this happen. We are, therefore, requiring that concrete plants notify the Division of its “remote” washout sites. These must also be approved by the Division. The NOI form contains space for this information.

Signs

Permittees will be required to post a sign at the process waste water outfall that serves to notify the public of the nature of the discharge and that the discharge is regulated by the Division of Water Pollution Control.

Standard conditions

Numerous standard NPDES permit conditions will be incorporated in the general permit, as required by EPA regulations. Standard requirements regard duty to comply, renotification, proper operation and maintenance, signatory requirements, etc..

VI. Notification requirements and authorization to discharge

A. Permit coverage

The permit will authorize discharges of process waste water and/or storm water runoff associated with the operation of ready mix concrete facilities to waters of the State of Tennessee.

B. Notice of Intent (NOI) requirements

Facilities who are requesting coverage under this general permit must submit the following information. A NOI form is included as Appendix A.

- i. legal or official name of the facility, mailing address, existing NPDES permit number (if existing), and county of the ready mix concrete facility for which notification is submitted;
- ii. name of the owner or operator of the facility, address, contact person, phone number of the contact person, and email address of the contact person if applicable;
- iii. a facility location map with boundaries at least 1 mile outside the facility property and with the facility outlined and identified and the water receiving the discharge highlighted and identified;
- iv. identification of the type of discharge, i.e., process waste water and storm water runoff or storm water runoff only (with process waste water being recycled;

- v. the name of the receiving waters of the discharge;
- vi. a description of the treatment system used at the facility;
- vii. if quantitative data that describe the concentration of pollutants in the storm water discharges is available;
- viii. the area expressed in acres of the facility, minus the area of undeveloped land; and the area of impervious surfaces on facility property; and
- ix. any additional information the Division may require.

C. Authorization to discharge

We propose to administer the issuance of permits to facilities covered under this general permit according to the following procedures.

- i. Two copies of the NOI's shall be submitted to the appropriate Environmental Assistance Centers (EAC). Each EAC will review these for completeness and accuracy and then forward one of the copies to the Permit Section.
- ii. The general permit issued to a specific ready mix concrete facility will be assigned a number. The permit will be mailed to the applicant. A copy of the permit will be retained by the Division, and a copy will be forwarded to the appropriate EAC.
- iii. The Permit Section will notify the Division's Enforcement and Compliance Section of the facility and the facility's permit limits, as with individual NPDES permits, for coding into the Permit Compliance System.

VII. Permit issuance procedures

This general permit is drafted in accordance with applicable NPDES regulations (40 Code of Federal Regulations 122, 123, 124, and 125) the Tennessee Water Quality Control Act (§69-3-101 et seq.), and the Department's permit issuance regulations (Rules of the Department 1200-4-10-.01, -.02, and -.03). This permit will be issued for a term not to exceed five years.